

DETAILED ACTION

1. This Office action is in response to Applicant's amendment filed 09/18/2008.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "a plurality of active differential probes" (e.g. claim 4) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the examiner is unclear how does the shunt generate a resistance? Applicant is respectfully reminded that the shunt is a resistor (See Applicant's specification paragraphs 79, 82). Every resistor (Including the shunt as claimed) has predetermined resistance. Therefore, examiner is unclear what is meant by "a measuring circuit having a shunt for generating a resistance upon receiving a current signal"? Even if the "shunt" is capable of generating a resistance by a ratio of voltage over the current (As examiner assumes), the generated resistance is redundant because, as examiner mentioned above, the shunt is a known resistance.

For the purpose of examination, examiner assumes that a measuring circuit converts the voltage across a shunt into current.

Claim 5 recites the limitation "all connections and resistors" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 7, lines 5-6, examiner is unclear the step of "taking the potential (Does applicant mean voltage?) measurement of the fuel cell for resistance (How?) when the open circuit of the fuel cell is closed. What is meant by open/closed circuit of the fuel cell?

Still refer to claim 7, examiner is unclear how is the pulse (Claim 7, line 3) related to other steps. From applicant's disclosure, it is impossible to cause a short circuit (By passing the fuel cell) because the bank of resistor. In other word, the positive and negative terminals across the fuel cell can not be short circuit because there's bank of resistor in between.

what is meant by "differential amplifiers for the current and the voltage signal"?

For the purpose of examination, examiner assumes that the claim was intended to recite differential amplifiers for differentiating the current and voltage signals?

Claim 8 recites the limitation "the reactance effect" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the noise effects" in line 2. There is insufficient antecedent basis for this limitation in the claim

Claims 2-6 and 9-11 are rejected for being dependent to the rejected claims 1 and 7.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2831

2. Claim 7 is rejected under 35 U.S.C. 102(e) as being anticipated by Hoenig et al. (6,618,681).

With respect to claims 7, Hoenig et al. discloses a method for measuring the total internal resistance of fuel cells and fuel cells stacks comprising the steps of generate an input pulse (By element 15); causing a short circuit in cell (F) (Switch D closed causing short circuit) (The MOSFET is inherent in elements 26 and 15)' measuring voltage (By element 16); and obtaining the fuel cell current signal by means of a shunt (E) and sending a voltage/current signal to an acquisition (12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 6, 8, 9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoenig et al. (6,618,681) in view of Sturman et al. (6,076,018).

With respect to claims 1, 3, 5, 6, 8, 9, 11, Hoenig et al. discloses an apparatus for the measurement resistance of fuel cells comprising an electronic load system (Figure 1) having an input unit (15) generating an input pulse; a driver (26) for the control of the input pulse; a MOSFET module having at least one MOSFET device for receiving a signal from the driver at a gate module of the MOSFET device (MOSFET is inherent in the module 26, 15), and a measuring circuit having a shunt (E), a circuit (16) for measure the voltage.

Hoenig et al. does not disclose a bank of selectable resistors.

Sturman et al. discloses a system similar to that of Hoenig and further discloses a bank of selectable resistor (S2, resistors R2-5) (Fig. 2-3) for the purpose of selecting a desired voltage from the voltage divider switching network.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bank of selectable resistors as taught by Sturman et al. into the system of Hoenig et al. because using a bank of selectable resistors to select a desired voltage is a fundamental of Ohm's law and involves only routine skill in the art.

With respect to claim 2, the only difference between Hoenig et al. and the claimed invention is that the claimed invention recites the MOSFET module produces short circuit pulses ranging between 0.1 and 100 msec whereas Hoenig et al. generally disclose that the pulse duration can be different (Col. 8 lines 24-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pulse duration between 0.1 and 100 msec. into the system of Hoenig et al. because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Arguments

5. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent Q. Nguyen whose telephone number is (571) 272-2234. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutiérrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vincent Q. Nguyen/
Primary Examiner, Art Unit 2858

October 23, 2008